CHAPTER 7.0
ALTERNATIVES

CEQA Guidelines Section 15126(d)(2) specifies that the range of potential alternatives to be examined in an EIR shall include those that could feasibly accomplish most of the basic purposes of the project and could avoid or substantially lessen one or more of the significant effects. CEQA specifically requires the discussion of a "no project" alternative. In addition, CEQA requires that a reasonable range of alternatives to the project be discussed, including alternative locations. The reasonable range includes alternatives that focus on mitigation or avoidance of significant effects associated with the proposed DMP Update, that permit a reasoned choice for the decision maker, and that are feasible. Section 15126(d)(5) states that among the factors that may be taken into account when addressing the feasibility of alternatives are site availability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries, and whether the proponent can reasonably acquire, control, or otherwise have access to the alternative site. A discussion of alternatives that were considered, but ultimately rejected, is also provided in Section 7.1.

In the following sections, each alternative is first described and then analyzed in consideration of the proposed DMP Update, according to whether it would have a beneficial or adverse effect. The alternatives analysis evaluates each identified alternative with respect to each issue area, in comparison to the DMP Update, as proposed. The alternative analysis also discusses the ability of each alternative to achieve the objectives of the DMP Update, as set forth in Section 3.2 of this EIR. Section 7.5 summarizes these findings and presents the conclusion about which alternative is the environmentally superior alternative.

7.1 ALTERNATIVES CONSIDERED

Alternatives that were considered but ultimately rejected are described below to demonstrate the range of alternatives that were considered. A brief discussion explaining why these alternatives were not considered further for a comparative analysis is also provided.

7.1.1 Program Level

Alternative Drainage System Location – An alternative that is often considered for an alternatives analysis involves altering the location of a proposed project. For the DMP Update,

this would involve an alternative location of the overall drainage system in the city. It is not reasonable to construct an entirely new drainage system, and an alternative location for the entire system is infeasible, as infrastructure is located or would be constructed in specific locations identified as critical parts of overall drainage systems. General locations of drainage facilities are determined by existing hydrology/drainage, topography, and development. For these reasons, alternative locations for proposed facilities are not considered further in this analysis.

No Impacts within or adjacent to the Coastal Zone or HMP Preserve – To minimize potential impacts to the Coastal Zone and/or HMP preserve areas from implementation of DMP Update components, this alternative would eliminate implementation of proposed components or activities that would be located within or adjacent to the Coastal Zone or HMP preserve. This alternative would not be reasonable because it would not address necessary drainage improvements or additional facility requirements in the entire Coastal Zone or HMP preserve areas, which together encompass approximately 13,588 acres, or 50 percent of the city. Facilities located within or adjacent to the HMP preserve and Coastal Zone are integral components of the overall drainage systems for each basin. This alternative would result in potential flooding hazards and impacts to water quality over large areas in the city and would, therefore, not achieve the objectives of the DMP Update. For these reasons, this alternative is not considered further in this analysis.

No Impacts within or adjacent to Sensitive Habitats or Wetlands – This alternative would eliminate proposed components or activities that would be located within or adjacent to the sensitive habitats or wetlands to minimize impacts to sensitive biological and water resources. However, similar to the alternative described above, this alternative would not address necessary drainage improvements or additional facility requirements in areas within or adjacent to sensitive habitats or wetlands, resulting in potential flooding hazards and impacts to water quality within these areas, as well as downstream. This alternative would not achieve the overall objectives of the DMP Update. For these reasons, this alternative is not considered further in this analysis.

No Dredging or Vegetation Removal Alternative – This alternative would avoid any dredging activities or vegetation removal as part of any component or operation and maintenance activity proposed in the DMP Update. This alternative would reduce overall water quality and noise impacts, minimize vegetation disturbance, and eliminate construction-related traffic impacts associated with dredging activities. However, capacity-related deficiencies in existing drainage infrastructure are often caused by accumulated silt, sand, overgrown vegetation, and debris. Dredging and vegetation removal are necessary to restore and maintain the 100-year flood capacity of deficient facilities. This alternative would not adequately address capacity-related

facility deficiencies, which would result in flood hazards and adverse impacts to water quality from sediment loading and debris. Therefore, this alternative would not meet the purpose or overall objective of the DMP Update. A more reasonable option than to completely eliminate any dredging or vegetation removal would be to allow only nonmechanized dredging or vegetation removal to reduce impacts associated with large-scale dredging projects and clear-cutting of vegetation. This reduced-scale alterative is considered more feasible than prohibiting all mechanized dredging/vegetation removal and is evaluated in comparison to the DMP Update in Section 7.2.1.

7.1.2 Project Level

Following the 1996 amendment to the MDSQMP to include Agua Hedionda Creek as a PLDA project (see Section 3.1.1), the City contracted Rick Engineering Company to conduct a study to evaluate various design alternatives to achieve 100-year flood capacity in Agua Hedionda and Calavera creeks (Rick Engineering Company 2004). The design alternatives considered various combinations of the following actions: improvements to Calavera Dam and the existing BJB Basin, construction of new detention basins (referred to as Melrose, Faraday, and BJ in the Rick Engineering Company report), and channel improvements and dredging within Agua Hedionda Creek. Dredging and maintenance within Calavera Creek were not considered as part of these alternatives. These alternatives were ultimately rejected, however, because they did not provide 100-year flood protection for as many lots as feasible (compared to the proposed DMP Update components, which would alleviate all but nine lots from inundation during a 100-year flood event).

Alternatives that were considered but determined infeasible are summarized briefly below. These alternatives are described in more detail in the Rick Engineering Company report (2004), included in Appendix B. Feasible alternatives to the proposed drainage improvements in Agua Hedionda and Calavera creeks are evaluated in Section 7.3.

No Action Alternative - The no action alternative evaluated in the Rick Engineering Company report modeled a 100-year flood event under the existing channel topography (at the time of the study), with ultimate buildout hydrology. This alternative involved no channel modifications or maintenance to Agua Hedionda or Calavera creeks and assumed no improvements to Calavera Dam or modifications/construction of detention basins (Melrose, Faraday, BJB, and BJ). This alternative would subject up to 260 of the 278 Rancho Carlsbad lots to inundation during a 100-year flood event and, therefore, was considered infeasible.

Existing Conditions Detained Alternative - This alternative also modeled a 100-year flood event under the existing channel topography at the time of the Rick Engineering Company study, with ultimate buildout hydrology but assumed modifications/construction of the four detention basins mentioned above, as well as improvements to Calavera Dam. This alternative would subject up to 225 lots to inundation during a 100-year flood event and, therefore, was considered infeasible.

Alternative A - This alternative assumed existing conditions in Calavera Creek and modeled maintenance of approximately 2,500 feet of Agua Hedionda Creek, between El Camino Real and just downstream of Rancho Carlsbad Drive. The ultimate development hydrology was the same as described above for the Existing Conditions Alternative. Agua Hedionda would be graded to the original trapezoidal channel geometry from the 1969 grading plans for Rancho Carlsbad, including 2:1 (H:V) side slopes and a bottom width of 44 to 58 feet. This alternative would subject up to 163 lots to inundation during a 100-year flood event and, therefore, was considered infeasible.

Alternative B - This alternative assumed existing conditions in Calavera Creek and modeled maintenance of approximately 3,100 feet of Agua Hedionda Creek between Cannon Road Bridge and just downstream of Rancho Carlsbad Drive. The ultimate development hydrology was the same as described above for the Existing Conditions Alternative. Grading would occur in Agua Hendionda Creek to remove accumulated sediment and create a trapezoidal channel with 2:1 (H:V) side slopes and a 70-foot bottom width. This alternative would subject up to 33 lots to inundation during a 100-year flood event and, therefore, was considered infeasible.

7.2 Program Level Alternatives Analysis

The following provides a comparative alternatives analysis for the proposed DMP Update. Alternatives are evaluated and compared by each resource area to identified impacts of the proposed DMP Update, as evaluated in Chapter 4.0 of this EIR.

7.2.1 No Mechanized Dredging/Vegetation Removal Alternative

Dredging and/or vegetation removal is proposed for some DMP Update components to improve and/or maintain facilities deficient in containing a 100-year flood. This alternative would prohibit use of mechanized equipment to conduct dredging or vegetation removal during construction, operation, or maintenance of proposed or future DMP components. Dredging and vegetation removal would instead be conducted in specified locations by ground crews using nonmechanized hand tools. This alternative would eliminate the possibility of large-scale dredging/vegetation

removal projects. The primary purpose of this alternative would be to reduce impacts to biological resources and water quality associated with dredging and vegetation removal.

7.2.1.1 Land Use

Like the DMP Update, the No Mechanized Dredging/Vegetation Removal Alternative would not divide an established community, no land uses designation or zoning changes would be required, and it is assumed that development would occur according to the General Plan and other land use policies. As described in Section 4.1, the DMP Update would not have a potentially significant land use impact. The DMP Update proposes conducting large-scale mechanized dredging and/or vegetation removal in channels that do not meet 100-year flood capacity due to excessive quantities of accumulated sediment, vegetation, and debris, which could not be removed using only hand tools. While small localized areas could be effectively cleared of vegetation or accumulated sediment, the No Mechanized Dredging/Vegetation Removal Alternative would prevent large-scale dredging and/or vegetation removal requiring the use of mechanized equipment. This could result in potential flood hazards within channels that would not meet 100-year flood capacity through only nonmechanized dredging and/or vegetation removal. Inadequate drainage infrastructure resulting in flooding hazards would be inconsistent with the General Plan and would result in an impact to land use (see Section 4.1). For these reasons, this alternative would result in greater land use impacts than the DMP Update.

7.2.1.2 Agricultural Resources

Similar to the DMP Update, the No Mechanized Dredging/Vegetation Removal Alternative would not result in the conversion of Important Farmland or convert agriculture land use to nonagricultural uses. This alternative is considered environmentally similar to the DMP Update for the agricultural resources issue area.

7.2.1.3 Visual Resources

The DMP Update would not have potentially significant impacts to visual resources. Although no large-scale clear-cutting of vegetation would be implemented with the No Mechanized Dredging/Vegetation Removal Alternative, this alternative would still allow removal of vegetation in undeveloped open space areas through the use of hand tools, which may result in degradation of views. The temporary visual impact associated with the loss of vegetation would likely be similar to the proposed DMP Update and would require landscaping to be incorporated into project-specific

design, as identified in Table 3-6. This alternative would be considered environmentally similar to the DMP Update with respect to visual resources.

7.2.1.4 Transportation/Circulation

The DMP Update would not result in significant impacts to transportation/circulation. The No Mechanized Dredging/Vegetation Removal Alternative would have fewer short-term construction-related traffic impacts because it would reduce truck traffic required to remove large quantities of material generated from mechanized dredging/vegetation removal activities. However, sediment/vegetation removed by hand would still be trucked out. Additionally, more workers may be required to complete sediment/vegetation removed by hand, generating more vehicle trips to and from the work site. The duration of sediment and vegetation removal by hand also may exceed the time necessary to accomplish the same tasks by mechanized means. Like the DMP Update, this alternative would still have short-term construction-related traffic impacts from other construction activities, which would be minimized through implementation of the traffic control measures identified in Table 3-6. This alternative would not have long-term impacts to traffic. The No Mechanized Dredging/Vegetation Removal Alternative is considered environmentally similar to the DMP Update with respect to transportation/circulation.

7.2.1.5 Air Quality

The DMP Update would not result in significant air quality impacts. Incorporation of construction measures in Table 3-6 would minimize construction-related air quality contamination from fugitive dust and exhaust. The No Mechanized Dredging/Vegetation Removal Alternative would also not result in significant air quality impacts and would reduce localized air quality impacts such as fugitive dust and exhaust that may occur with the use of mechanized equipment for dredging/vegetation removal activities. This alternative would have less potential for fugitive dust and exhaust than the DMP Update, but because neither this alternative nor the DMP Update would result in significant impacts to air quality, they are considered environmentally similar from an air quality perspective.

7.2.1.6 Noise

The DMP Update would result in significant noise impacts related to construction activities, which would be mitigated to below a level of significance. The No Mechanized Dredging/Vegetation Removal Alternative would eliminate direct and indirect noise impacts associated with the use of mechanized dredging/vegetation removal equipment. However, other construction-related noise

impacts would be similar as those resulting from the DMP Update, which could be reduced to a less than significant level with the mitigation measures included in Section 4.6. For these reasons, this alternative would have fewer noise impacts than the DMP Update, although overall impacts would still be significant but mitigable.

7.2.1.7 Recreation

The DMP Update would not result in significant impacts to recreational services in the city. Similar to the DMP Update, the No Mechanized Dredging/Vegetation Removal Alternative would not result in impacts to recreational facilities or services and would be environmentally similar to the DMP Update with respect to recreational services.

7.2.1.8 Geology/Soils

The No Mechanized Dredging/Vegetation Removal Alternative would generally eliminate the potential for impacts to geology/soils associated with mechanized dredging/vegetation removal (e.g., liquefaction, substantial soil erosion). However, potential impacts to geology/soil would still occur from other construction activities associated with proposed components, as identified with the DMP Update, and there may still be a need to construct access roads to reach work areas. Impacts would be minimized with the project design features/methods and construction measures identified in Table 3-6 and would not be considered significant. The No Mechanized Dredging/Vegetation Removal Alternative would be considered environmentally similar to the DMP Update with respect to geology/soils.

7.2.1.9 Hydrology/Water Quality

The DMP Update would not result in significant adverse impacts to water quality and would provide an overall long-term improvement to storm water quality (see Section 4.9). Short-term impacts to water quality resulting from mechanized dredging would be minimized through implementation of the project design features/methods and construction measures identified in Table 3-6 and would not be considered significant. The No Mechanized Dredging/Vegetation Removal Alternative would also provide overall improvements to storm water quality and would prevent temporary water quality impacts associated with mechanized dredging/vegetation removal. Because neither the DMP Update nor this alternative would result in long-term significant water quality impacts and would both provide overall improvements to storm water quality, they would be considered environmentally similar with respect to hydrology/water quality.

7.2.1.10 Biological Resources

The DMP Update would result in significant impacts to biological resources resulting from the potential loss of habitat and sensitive biological resources, specifically riparian and wetland habitat. The No Mechanized Dredging/Vegetation Removal Alternative would reduce potential impacts to sensitive vegetation by preventing mechanized vegetation removal. However, vegetation could still be removed using hand tools and would potentially result in similar potentially significant impacts. With the exception of impacts associated with mechanized dredging/vegetation removal, this alternative would still result in similar impacts to biological resources as the DMP Update. Significant impacts could be reduced to a less than significant level with the mitigation measures included in Section 4.10. The No Mechanized Dredging/Vegetation Removal Alternative would have fewer impacts to biological resources than the DMP Update but would still have significant impacts overall.

7.2.1.11 Cultural Resources

The DMP Update would result in potentially significant impacts to cultural resources. The No Mechanized Dredging/Vegetation Removal Alternative would eliminate potential impacts to cultural resources resulting from mechanized dredging. However, this alternative would have similar impacts to cultural resources as the DMP Update, resulting from other excavation and grading activities. Impacts could be reduced to a less than significant level with the mitigation measures included in Section 4.11. This alternative would have fewer impacts than the DMP Update with respect to cultural resources but would still result in significant but mitigable impacts overall.

7.2.1.12 Paleontological Resources

The DMP Update would result in potentially significant impacts to paleontological resources. The No Mechanized Dredging/Vegetation Removal Alternative would eliminate potential impacts to paleontological resources associated with mechanized dredging. However, this alternative would have similar impacts to paleontological resources as the DMP Update, resulting from other excavation and grading activities. Impacts could be reduced to a less than significant level with the mitigation measure included in Section 4.12. This alternative would have fewer impacts than the DMP Update with respect to paleontological resources but would still result in significant but mitigable impacts overall.

7.2.2 Reduced Impacts to Sensitive Habitats and Wetlands Alternative

The Reduced Impacts to Sensitive Habitats and Wetlands Alternative would eliminate implementation of proposed DMP Update components within or adjacent to sensitive habitats or wetlands located within the Coastal Zone and/or HMP preserve. These facilities would potentially be relocated or redesigned to avoid these areas, but some components could likely be eliminated due to geographic constraints of specific drainage location needs that could not be provided in alternative locations. Construction, operations, and maintenance of DMP Update components could still occur within the Coastal Zone or HMP preserve but would be limited to areas outside sensitive habitats or wetlands. The primary purpose of this alternative would be to reduce impacts to biological resources and water quality.

7.2.2.1 Land Use

Like the DMP Update, the Reduced Impacts to Sensitive Habitats and Wetlands Alternative would not divide an established community, no land uses designation or zoning changes would be required, and it is assumed that development would occur according to the General Plan and other land use policies. The DMP Update would not have potentially significant land use impacts. The Reduced Impacts to Sensitive Habitats and Wetlands Alternative would eliminate direct long-term impacts to sensitive habitats and wetlands within the Coastal Zone and HMP preserve. Facilities could potentially be relocated to areas outside of sensitive habitats or wetlands, or redesigned to redirect 100-year floods from habitable areas. However, this alternative would prevent any enhancements or modifications (such as dredging, removal of accumulated debris/vegetation, widening of channels, etc.) to deficient facilities that are unable to contain a 100-year flood event within these localized areas. This could result in potential land use impacts from flooding hazards for facilities that would not meet 100-year flood capacity. For these reasons, this alternative would result in greater impacts to land use than the DMP Update.

7.2.2.2 Agricultural Resources

Similar to the DMP Update, the Reduced Impacts to Sensitive Habitats and Wetlands Alternative would not result in the conversion of Important Farmland or convert agriculture land use to nonagricultural uses. This alternative is considered environmentally similar to the DMP Update regarding agricultural resources.

7.2.2.3 Visual Resources

The Reduced Impacts to Sensitive Habitats and Wetlands Alternative would eliminate construction-related visual impacts of the DMP Update within these localized areas. This alternative would have similar potential for visual impacts as the DMP Update, with the exception of impacts in sensitive habitat or wetland areas in the Coastal Zone and HMP preserve. Similar to the DMP Update, project design features/methods and construction measures included in Table 3-6 could minimize temporary construction- or design-related visual impacts from this alternative. For these reasons, this alternative would be environmentally similar the DMP Update with respect to visual resources.

7.2.2.4 Transportation/Circulation

The DMP Update would not result in any significant impacts to transportation/circulation. The Reduced Impacts to Sensitive Habitats and Wetlands Alternative would have fewer short-term construction-related traffic impacts by eliminating construction activities within sensitive habitats or wetlands within the Coastal Zone or HMP preserve. However, short-term construction-related traffic impacts would still occur outside of these localized areas, as with the DMP Update. Additionally, a facility relocated within a right-of-way could result in similar or increased short-term construction impacts compared to activities within sensitive areas. As with the DMP Update, temporary traffic impacts from construction activities would be minimized through implementation of the project design features/methods and construction measures identified in Table 3-6. This alternative would not have long-term impacts to traffic. The Reduced Impacts to Sensitive Habitats and Wetlands Alternative is considered environmentally similar to the DMP Update with respect to transportation/circulation.

7.2.2.5 Air Quality

The DMP Update would not result in significant air quality impacts but would involve the incorporation of construction measures (see Table 3-6) to minimize construction-related impacts such as contamination from fugitive dust and exhaust. The Reduced Impacts to Sensitive Habitats and Wetlands Alternative would not involve construction with sensitive habitats or wetlands within the Coastal Zone or HMP preserve, eliminating air quality impacts from fugitive dust and exhaust in these localized areas. However, construction-related air quality impacts could still occur in the Coastal Zone and HMP outside of sensitive habitats or wetlands, which would be minimized with implementation of the project design features/methods and construction measures described in Table 3-6. With the incorporation of such measures, neither this alternative nor the DMP Update

would result in significant air quality impacts, so both alternatives are considered to be environmentally similar from an air quality perspective.

7.2.2.6 Noise

The DMP Update would result in potentially significant noise impacts related to construction activities, but these impacts would be mitigated to below a level of significance. The Reduced Impacts to Sensitive Habitats and Wetlands Alternative would not involve construction within or adjacent to sensitive habitats or wetlands within the Coastal Zone or HMP preserve, eliminating direct and indirect construction-generated noise impacts in these localized areas. Additionally, were facilities to be relocated or redesigned, potential construction-related noise impacts would be similar as those resulting from the DMP Update, which could be reduced to a less than significant level with the mitigation measures included in Section 4.6. For these reasons, this alternative would have fewer noise impacts than the DMP Update, although overall impacts would still be significant but mitigable.

7.2.2.7 Recreation

The DMP Update would not result in significant impacts to recreational services in the city. Similar to the DMP Update, the Reduced Impacts to Sensitive Habitats and Wetlands Alternative would not result in impacts to recreational facilities or services and would be environmentally similar to the DMP Update with respect to recreational services.

7.2.2.8 Geology/Soils

The Reduced Impacts to Sensitive Habitats and Wetlands Alternative would have similar impacts to geology/soils as the DMP Update, with the exception of impacts in sensitive habitats or wetlands areas within the Coastal Zone or HMP preserve. Impacts to geology/soil would not occur in these localized areas but would still occur throughout the remaining areas of the city. Additionally, were facilities to be relocated or redesigned, the potential for impacts to geology/soils is anticipated to be comparable to the potential associated with proposed DMP components. The project design features/methods and construction measures included in Table 3-6 could minimize impacts to geology/soils resulting from this alternative, as described in Section 4.8. For these reasons, this alternative would be environmentally similar to the DMP Update with respect to geology/soils.

7.2.2.9 Hydrology/Water Quality

The DMP Update would not result in significant impacts to water quality and would provide an overall long-term improvement to storm water quality. Short-term impacts to water quality resulting from mechanized dredging would be minimized through implementation of the project design features/methods and construction measures identified in Table 3-6 and would not be considered significant. The Reduced Impacts to Sensitive Habitats and Wetlands Alternative would also provide overall improvements to storm water quality. Compared to the DMP Update, this alternative would further prevent temporary water quality impacts associated with construction of DMP components within sensitive habitats or wetlands located in the Coastal Zone or HMP preserve. Because neither the DMP Update nor this alternative would result in long-term water quality impacts and both would provide overall improvements to storm water quality, they are environmentally similar with respect to hydrology/water quality.

7.2.2.10 Biological Resources

The DMP Update would result in potentially significant but mitigable impacts to biological resources resulting from the potential loss of wetland or riparian habitat within the Coastal Zone and HMP preserve, whereas the Reduced Impacts to Sensitive Habitats and Wetlands Alternative would eliminate such impacts. However, similar to the DMP Update, this alternative would still result in potentially significant impacts to biological resources outside of the Coastal Zone and HMP preserve. Significant impacts could be reduced to a less than significant level with the mitigation measures included in Section 4.10. This alternative would have fewer impacts to biological resources than the DMP Update but would still have significant but mitigable impacts overall.

7.2.2.11 Cultural Resources

The DMP Update would result in potentially significant but mitigable impacts to cultural resources. The Reduced Impacts to Sensitive Habitats and Wetlands Alternative would not have impacts to cultural resources within or adjacent to habitats or wetlands within the Coastal Zone or HMP preserve. However, this alternative would have similar impacts to cultural resources as the DMP Update outside of these localized areas. Additionally, if a facility were to be relocated, the potential for cultural impacts would be similar to the potential associated with proposed DMP Update components. Impacts could be reduced to a less than significant level with the mitigation measures included in Section 4.11. For these reasons, the Reduced Impacts to Sensitive Habitats and Wetlands Alternative would be environmentally similar to the DMP Update with respect to cultural resources.

7.2.2.12 Paleontological Resources

The DMP Update would result in potentially significant but mitigable impacts to paleontological resources. The Reduced Impacts to Sensitive Habitats and Wetlands Alternative would not have impacts to paleontological resources within or adjacent to habitats or wetlands within the Coastal Zone or HMP preserve. However, this alternative would have similar impacts to paleontological resources as the DMP Update outside of these localized areas. Additionally, if a facility were to be relocated, the potential for paleontological impacts would be similar to the potential associated with proposed DMP Update components. Impacts could be reduced to a less than significant level with the mitigation measure included in Section 4.12. For these reasons, the Reduced Impacts to Sensitive Habitats and Wetlands Alternative would be environmentally similar to the DMP Update with respect to paleontological resources.

7.2.3 Reduced Use of Impervious Materials Alternative

Impervious surfaces increase storm water runoff, flow velocities, and pollutant loading by reducing surface area available for filtration of pollutants and groundwater infiltration. Increase in impervious surfaces can therefore result in water quality issues downstream, such as increased pollutant loading, erosion, and scour. The Reduced Use of Impervious Materials Alternative would reduce the construction of impervious structures or surfaces associated with proposed DMP Update components. Concrete structures (e.g., trapezoidal channels, drop structures, box culverts, and riprap) would not be constructed within undeveloped channels or drainages to minimize impervious surfaces. Drainage channels would instead be constructed or modified as earthen channels, and concrete structures could also be removed from some existing drainages as part of necessary repair/maintenance work. Only pervious materials would be used for slope stabilization and erosion control, such as vegetation, mulch, erosion control blankets/mats, and rock slope protection. Installation of pervious materials for slope stabilization and erosion control could be less invasive and reduce the need for mechanized equipment. For example, installation of an erosion blanket could be performed by hand, while concrete installation would require mechanized equipment. Use of pervious materials would also allow for more vegetation growth on natural channel banks and slopes. The primary purpose of this alternative would be to reduce potential biological and water quality impacts resulting from impervious surfaces.

7.2.3.1 Land Use

Like the DMP Update, the Reduced Use of Impervious Materials Alternative would not divide an established community, no land uses designation or zoning changes would be required, and it

is assumed that development would occur according to the General Plan and other land use policies. The Reduced Use of Impervious Materials Alternative would still involve the implementation of components in the same locations proposed in DMP Update, but it would reduce the use of impervious materials in these locations. Short-term construction-related impacts to land use would be similar to those associated with the DMP Update. Neither this alternative nor the DMP Update would have potentially significant land use impacts. For these reasons, this alternative would be environmentally similar to the DMP Update from a land use perspective.

7.2.3.2 Agricultural Resources

Similar to the DMP Update, the Reduced Use of Impervious Materials Alternative would not result in the conversion of Important Farmland or convert agriculture land use to nonagricultural uses. This alternative is considered environmentally similar to the DMP Update for the agricultural resources issue area.

7.2.3.3 Visual Resources

The DMP Update would not result in potentially significant impacts to visual resources. The Reduced Use of Impervious Materials Alternative would reduce the potential visual impact within undeveloped areas resulting from the use of concrete in natural drainages. Existing undeveloped drainages would retain a more natural appearance and some drainages would be restored to a more natural state. However, this alternative would still allow removal of vegetation or alteration of natural drainages in undeveloped open space areas, which may still result in degradation of views. Similar to the DMP Update, project design features/methods and construction measures included in Table 3-6 could minimize temporary construction- or design-related visual impacts from this alternative. For these reasons, this alternative would be environmentally similar the DMP Update with respect to visual resources.

7.2.3.4 Transportation/Circulation

The DMP Update would not result in significant impacts to transportation/circulation. The Reduced Use of Impervious Materials Alternative would have short-term construction-related traffic impacts similar to those identified with the DMP Update. However, like the DMP Update, traffic impacts from construction activities would be minimized through implementation of the project design features/methods and construction measures identified in Table 3-6. Similar to the proposed DMP Update, this alternative would not have long-term impacts to

traffic. The Reduced Use of Impervious Materials Alternative is considered environmentally similar to the DMP Update with respect to transportation/circulation.

7.2.3.5 Air Quality

The DMP Update would not result in significant air quality impacts. The Reduced Use of Impervious Materials Alternative would reduce air quality impacts associated with construction of impervious structures or surfaces. However, components would still be constructed with alternative materials requiring mechanized equipment. This would result in similar potential for air quality impacts as the DMP Update associated with fugitive dust and exhaust from construction activities, which would be minimized with the incorporation of construction measures in Table 3-6. Due to the incorporation of these measures, neither this alternative nor the DMP Update would result in significant air quality impacts, so both alternatives are considered environmentally similar from an air quality perspective.

7.2.3.6 Noise

The DMP Update would result in potentially significant noise impacts related to construction activities, which would be mitigated to below a level of significance. The Reduced Use of Impervious Materials Alternative could reduce direct and indirect noise impacts associated with construction of impervious structures or surfaces because less equipment could be required to install impervious materials (such as Vmax) rather than concrete, which typically requires mechanized equipment. However, other construction-related noise impacts would be similar to those resulting from the DMP Update but could be reduced to a less than significant level with the mitigation measures included in Section 4.6. For these reasons, this alternative would have fewer noise impacts than the DMP Update, although overall impacts would still be significant but mitigable.

7.2.3.7 Recreation

The DMP Update would not result in significant impacts to recreational services in the city. Similar to the DMP Update, the Reduced Use of Impervious Materials Alternative would not result in impacts to recreational facilities or services and would be environmentally similar to the DMP Update with respect to recreation.

7.2.3.8 Geology/Soils

The Reduced Use of Impervious Materials Alternative would eliminate the potential for impacts due to geology/soils resulting from construction of components involving impervious structures or surfaces. However, components would still be constructed using alternative materials and impacts to geology/soil would still potentially occur from construction activities, as identified with the DMP Update. The project design features/methods and construction measures included in Table 3-6 could minimize impacts to geology/soils resulting from this alternative, as described in Section 4.8. The Reduced Use of Impervious Materials Alternative would have similar impacts to geology/soil as compared to the DMP Update.

7.2.3.9 Hydrology/Water Quality

The DMP Update would not result in significant adverse impacts to water quality and would provide overall long-term improvements to storm water quality. Short-term impacts to water quality resulting from mechanized dredging would be minimized through implementation of the project design features/methods and construction measures identified in Table 3-6 and would not be considered significant. The Reduced Use of Impervious Materials Alternative would also provide overall improvements to storm water quality and would reduce downstream water quality impacts in Carlsbad by maximizing pervious surfaces in drainage basins. Because neither this alternative nor the DMP Update would result in long-term water quality impacts and both would provide overall improvements to storm water quality, they are considered environmentally similar with respect to hydrology/water quality.

7.2.3.10 Biological Resources

The DMP Update would result in potentially significant impacts to biological resources resulting from the potential loss of habitat and sensitive biological resources. The Reduced Use of Impervious Materials Alternative would reduce long-term impacts to biological resources by allowing more vegetation growth on natural channel slopes and banks. However, this alternative would still result in temporary construction-related impacts, as identified with the DMP Update and there would still be impacts associated with periodic maintenance to clear vegetation for flood capacity purposes. Additionally, implementation of DMP components not involving impervious materials would still result in potentially significant impacts to biological resources and would require mitigation. Significant impacts could be reduced to a less than significant level with the mitigation measures included in Section 4.10. Overall, this alternative would have fewer impacts to biological resources than the DMP Update but would still have significant mitigable impacts.

7.2.3.11 Cultural Resources

The DMP Update would have potentially significant but mitigable impacts to cultural resources. The Reduced Use of Impervious Materials Alternative would have similar potential for impacts to cultural resources as the DMP Update resulting from excavation and grading activities. Significant impacts could be reduced to a less than significant level with the mitigation measures included in Section 4.11. This alternative would be environmentally similar to the DMP Update with respect to cultural resources.

7.2.3.12 Paleontological Resources

The DMP Update would have potentially significant but mitigable impacts to paleontological resources. The Reduced Use of Impervious Materials Alternative would have similar potential for impacts to paleontological resources as the DMP Update resulting from excavation and grading activities, which would require mitigation. Significant impacts could be reduced to a less than significant level with the mitigation measure included in Section 4.12. This alternative would be environmentally similar to the DMP Update with respect to paleontological resources.

7.2.4 No Project-No Update to the Existing 1994 MDSQMP Alternative

Under the No Project-No Update to the Existing 1994 MDSQMP Alternative, the City would continue to use the existing 1994 MDSQMP (including the 1996 update) as the planning tool for implementation of drainage infrastructure improvements, without implementation of any of the new components proposed in the DMP Update. Implementation, operation, or maintenance of drainage components would occur consistent with the 1994 MDSQMP. However, no new components would be constructed to accommodate storm flows generated from development beyond what was envisioned by the City in 1994. Additionally, no new maintenance components would be implemented beyond the maintenance needs identified in the 1994 MDSQMP.

7.2.4.1 Land Use

The DMP Update would not result in any significant land use impacts. Development patterns and land use have changed since adoption of the 1994 MDSQMP. The No Project-No Update to the Existing 1994 MDSQMP Alternative would not address any of the additional facilities identified as requiring maintenance in the DMP Update and would not provide additional infrastructure required to accommodate new storm flows generated from future planned

development in the city beyond what is provided by the 1994 MDSQMP. Without adequate drainage infrastructure, the city would be subject to flooding hazards, and sufficient drainage infrastructure would not be provided concurrently with development, which would be inconsistent with the General Plan (see Section 4.1). For these reasons, the No Project-No Update to the Existing 1994 MDSQMP Alternative would have greater impacts to land use than the DMP Update.

7.2.4.2 Agricultural Resources

Similar to the DMP Update, the No Project-No Update to the Existing 1994 MDSQMP Alternative would not involve conversion of Important Farmland or convert agriculture land use to nonagricultural uses. This alternative is considered environmentally similar to the DMP Update with respect to agricultural resources.

7.2.4.3 Visual Resources

The DMP Update would not have potentially significant impacts to visual resources. The No Project-No Update to the Existing 1994 MDSQMP Alternative would eliminate the potential for temporary visual impacts associated with implementation of proposed new DMP Update components beyond the components identified in the 1994 MDSQMP. However, existing facilities requiring maintenance would not be addressed under the No Project-No Update to the Existing 1994 MDSQMP Alternative and would continue to become degraded. A substantially degraded drainage facility could adversely impact visual resources if it were located within a scenic viewshed or corridor. For example, exposed riprap and eroded slopes in a drainage channel visible from an identified scenic corridor would be considered a visual impact. For these reasons, this alternative would have greater impacts to visual resources than DMP Update.

7.2.4.4 Transportation/Circulation

The DMP Update would not result in any significant long-term impacts to transportation/ circulation. The No Project-No Update to the Existing 1994 MDSQMP Alternative would not require construction, operations, or maintenance of proposed new DMP Update components beyond the components identified in the 1994 MDSQMP and would therefore not result in short-term construction impacts from construction activities associated with such components. However, potential flooding of roadways resulting from deficient drainage facilities would result in long-term and recurrent impacts to transportation/circulation, which may also result in traffic impacts due to unplanned emergency repairs. For this reason, the No Project-No Update to the

Existing 1994 MDSQMP Alternative would have greater impacts to transportation/circulation than the DMP Update.

7.2.4.5 Air Quality

The DMP Update would not result in significant air quality impacts but would involve the incorporation of construction measures (see Table 3-6) to minimize construction-related impacts such as contamination from fugitive dust and exhaust. The No Project-No Update to the Existing 1994 MDSQMP Alternative would eliminate air quality impacts associated with construction activities for the proposed new DMP Update components. However, because neither this alternative nor the DMP Update would result in significant air quality impacts, both alternatives are considered environmentally similar from an air quality perspective.

7.2.4.6 Noise

The DMP Update would result in potentially significant noise impacts related to construction activities, but impacts would be mitigated to below a level of significance. The No Project-No Update to the Existing 1994 MDSQMP Alternative would eliminate direct and indirect noise impacts associated with construction, operations, and maintenance of proposed new DMP Update components. This alternative would have fewer short-term noise impacts than the DMP Update.

7.2.4.7 Recreation

The DMP Update would not result in significant impacts to recreational services in the city. Similar to the DMP Update, the No Project-No Update to the Existing 1994 MDSQMP Alternative would not result in impacts to recreational facilities or services. This alternative would be environmentally similar to the DMP Update with respect to recreational services.

7.2.4.8 Geology/Soils

The project design features/methods and construction measures included in Table 3-6 would minimize construction-related impacts to geology/soils resulting from implementation of the DMP Update. The DMP Update would not result in potentially significant impacts to geology/soils associated with construction of proposed components. The No Project-No Update to the Existing 1994 MDSQMP Alternative would eliminate the potential for construction-related impacts from geology/soils associated with construction of proposed new DMP Update

components. Neither this alternative nor the DMP Update would result in significant impacts, so they are considered environmentally similar with respect to geology/soils.

7.2.4.9 Hydrology/Water Quality

The DMP Update would not result in significant impacts to water quality and would provide an overall improvement to storm water quality. The No Project-No Update to the Existing 1994 MDSQMP Alternative would not provide overall improvements to storm water quality and would not allow for citywide assessment and evaluation of hydrology/water quality issues. Degraded drainage facilities would affect water quality through increased potential for erosion, pollutant loading, and sedimentation. Increased storm flows from future planned development would not be adequately addressed. Additionally, increased flooding would result in potential impacts to water quality and hydrology due to increased pollutant loading and sedimentation and changes in drainage capacities. For these reasons, the No Project-No Update to the Existing 1994 MDSQMP Alternative would have greater impacts to hydrology/water quality than the DMP Update.

7.2.4.10 Biological Resources

The DMP Update would result in potentially significant impacts to biological resources resulting from the potential loss of habitat and sensitive biological resources, which would be mitigated to a less than significant level. The No Project-No Update to the Existing 1994 MDSQMP Alternative would eliminate impacts to biological resources resulting from implementation of proposed new DMP components. This alternative generally would have fewer impacts to biological resources than the DMP Update. However, without adequate infrastructure to handle flooding, unplanned impacts to biological resources could occur as the result of emergency projects.

7.2.4.11 Cultural Resources

The DMP Update would have potentially significant impacts to cultural resources, which would be mitigated to a less than significant level. The No Project-No Update to the Existing 1994 MDSQMP Alternative would eliminate impacts to cultural resources resulting from implementation of proposed new DMP components. This alternative would have fewer impacts than the DMP Update with respect to cultural resources.

7.2.4.12 Paleontological Resources

The DMP Update would have potentially significant impacts to paleontological resources, which would be mitigated to a less than significant level. The No Project-No Update to the Existing 1994 MDSQMP Alternative would eliminate impacts to paleontological resources resulting from implementation of proposed new DMP components. This alternative would have fewer impacts than the DMP Update with respect to paleontological resources.

7.2.5 No Project-No DMP Update Approval Alternative

Under the No Project-No DMP Update Approval Alternative, the DMP Update would not be adopted by the City as an overall drainage improvement program. This does not mean, however, that the facilities proposed in the DMP Update, or other additional drainage facilities, would not be constructed. Many of the project components in the DMP Update would likely proceed regardless of approval the DMP Update program. In other words, projects proposed in the DMP Update could be constructed or implemented on an individual project basis whether or not the DMP Update is adopted, based on development and need in Carlsbad. Facility locations may be altered to provide more localized solutions, without consideration of overall citywide drainage needs. Under this alternative, construction, operations, and maintenance of drainage facilities would be subject to the same regulatory policies and requirements as the DMP Update and it is assumed implementation of individual projects would be consistent with these policies and regulations. The No Project-No DMP Update Approval Alternative would, however, deny the City a valuable planning tool that is informative for those interested in Carlsbad's future plans and facilities. It would also deprive the City of the opportunity for comprehensive citywide drainage infrastructure assessment and identification of ideal locations and facilities that most adequately address citywide drainage improvement needs while minimizing direct and cumulative environmental impacts. This comprehensive citywide assessment is important for the City to effectively assess need and maintain consistency with the Growth Management Program and General Plan, which require drainage facilities to be provided or required by the City concurrent with development.

The No Project-No DMP Update Approval Alternative would involve piecemeal[9] implementation and potential relocation of drainage facilities based on localized rather than citywide needs. It is difficult to compare, even qualitatively, potential impacts relative to the

[9] CEQA Guidelines and supporting case law state that if there is reasonable knowledge that a larger project or series of projects is planned, the environmental review must consider the impacts of the project as a whole (Section 15378).

DMP Update since facility locations are unknown for this alternative. Therefore, for most of the issue areas, the comparative alternative analysis is considered undetermined.

7.2.5.1 Land Use

The DMP Update would not result in significant land use impacts. The No Project-No DMP Update Approval Alternative would involve implementation of the same or similar proposed drainage components, although locations of specific components could differ. Regardless of approval of the DMP Update as a programmatic document, implementation of drainage improvement projects is anticipated to be consistent with land use in the city. For these reasons, this alternative would be environmentally similar the DMP Update with respect to land use.

However, the No Project-No DMP Update Approval Alternative may be inconsistent with the policies of the LCP, at least as far as proposed development in the coastal zone is concerned. The LCP requires implementation of drainage projects in the DMP. Inconsistency with the LCP would be a significant effect.

7.2.5.2 Agricultural Resources

The DMP Update would not result in the conversion of Important Farmland or convert agricultural land use to nonagricultural uses. The No Project-No DMP Update Approval Alternative could potentially involve conversion of Important Farmland or convert agricultural land use to nonagricultural uses, depending on future locations of drainage components. Because facility locations have not been determined, it is unknown if this alternative would affect agricultural resources. Therefore, the comparison of land use impacts of the No Project-No DMP Update Approval Alternative to the DMP Update cannot be determined.

7.2.5.3 Visual Resources

The DMP Update would not have potentially significant impacts to visual resources. The No Project-No DMP Update Approval Alternative would involve implementation of the same or similar components as those proposed in the DMP Update and would result in similar visual impacts. However, future drainage components implemented under this alternative could potentially involve visually obtrusive structures that could result in significant impacts to visual resources. Because facility size and locations have not been determined, it is unknown if this alternative would affect visual resources. For example, a new bridge structure could be constructed in a scenic vista resulting in a significant impact to visual resources in the area. For

these reasons, the comparison of visual impacts of the No Project-No DMP Update Approval Alternative to the DMP Update cannot be determined.

7.2.5.4 Transportation/Circulation

The DMP Update would not result in significant long-term impacts to transportation/circulation. Short-term construction-related impacts would be minimized through implementation of the project design features/methods and construction measures identified in Table 3-6 and would not be significant. The No Project-No DMP Update Approval Alternative could involve implementation of the same or similar components as those proposed in the DMP Update. However, because facility locations have not been determined, it is unknown if this alternative would result in short- or long-term traffic impacts. For example, if construction of a facility located within a roadway required the roadway to be closed off for an extended period of time, this would be considered a significant unmitigable short-term impact to transportation/circulation. Therefore, the comparison of transportation/circulation impacts of the No Project-No DMP Update Approval Alternative to the DMP Update cannot be determined.

7.2.5.5 Air Quality

The DMP Update would not result in significant air quality impacts but would involve the incorporation of construction measures (see Table 3-6) to minimize construction-related impacts such as contamination from fugitive dust and exhaust. The No Project-No DMP Update Approval Alternative would involve similar air quality impacts associated with construction activities; however, because facility locations have not been determined, it is unknown if this alternative would result in short-term significant impacts. For example, if a facility would be constructed adjacent to a sensitive receptor, this could result in short-term unmitigable air quality impacts. For these reasons, the comparison of air quality impacts of the No Project-No DMP Update Approval Alternative to the DMP Update cannot be determined.

7.2.5.6 Noise

The DMP Update would result in significant noise impacts related to construction activities, which would be mitigated to below a level of significance. The No Project-No DMP Update Approval Alternative would also involve construction-related noise impacts associated with construction, operations, and maintenance of drainage components. However, because facility locations have not been determined, it is unknown if this alternative would result in short-term significant impacts. For example, if a facility would be constructed adjacent to a sensitive

receptor, this could result in short-term unmitigable noise impacts. For these reasons, the comparison of noise impacts of the No Project-No DMP Update Approval Alternative to the DMP Update cannot be determined.

7.2.5.7 Recreation

The DMP Update would not result in significant impacts to recreational services in the city. However, because facility locations have not been determined, it is unknown if the No Project-No DMP Update Approval Alternative would result in impacts to recreational services. For this reason, the comparison of impacts to recreational services from the No Project-No DMP Update Approval Alternative to the DMP Update cannot be determined.

7.2.5.8 Geology/Soils

The DMP Update would not result in significant mitigable impacts to geology/soils associated with construction of proposed components. The No Project-No DMP Update Approval Alternative would have the potential for impacts from geology/soils associated with construction of proposed drainage components. However because facility locations have not been determined, it is unknown if the No Project-No DMP Update Approval Alternative would result in unmitigable significant impacts to geology/soils. Therefore, the comparison of geology/soil-related impacts of the No Project-No DMP Update Approval Alternative to the DMP Update cannot be determined.

7.2.5.9 Hydrology/Water Quality

The DMP Update would not result in significant impacts to water quality and would provide an overall improvement to storm water quality. The No Project-No DMP Update Approval would not provide overall improvements to storm water quality and would not allow for citywide assessment and evaluation of hydrology/water quality issues. The DMP Update evaluates phased implementation of project components so that citywide drainage systems would maintain 100-year flood capacity. Citywide flood protection and drainage needs may not be met by implementing drainage improvements on a project-by-project basis. For these reasons, the No Project-No DMP Update Approval Alternative would have greater impacts to hydrology/water quality than the DMP Update.

7.2.5.10 Biological Resources

The DMP Update would result in significant impacts to biological resources resulting from the potential loss of habitat and sensitive biological resources. The No Project-No DMP Update Approval would involve construction of the same or similar drainage components as proposed in the DMP Update and would result in similar impacts to biological resources. However, because facility locations have not been determined, it is unknown if the No Project-No DMP Update Approval Alternative would result in unmitigable impacts to biological resources. More facilities could potentially be constructed within wetlands or sensitive habitats over buildout of the city than proposed in the DMP Update. There may not be opportunities to mitigate every impact, which would result in a cumulative, unmitigable, significant impacts to biological resources. For these reasons, the comparison of biological resources impacts of the No Project-No DMP Update Approval Alternative to the DMP Update cannot be determined.

7.2.5.11 Cultural Resources

The DMP Update would have significant mitigable impacts to cultural resources. The No Project-No DMP Update Approval would result in similar potential impacts to cultural resources resulting from construction of drainage components involving excavation or grading of native soils. However, because facility locations have not been determined, it is unknown if impacts to cultural resources from the No Project-No DMP Update Approval Alternative could be mitigated. For these reasons, the comparison of impacts to cultural resources from the No Project-No DMP Update Approval Alternative to the DMP Update cannot be determined.

7.2.5.12 Paleontological Resources

The DMP Update would have significant mitigable impacts to paleontological resources. The No Project-No DMP Update Approval would result in similar potential impacts to paleontological resources resulting from construction of drainage components involving excavation or grading of native soils. However, because facility locations have not been determined, it is unknown if impacts to cultural resources from the No Project-No DMP Update Approval Alternative could be mitigated. For these reasons, the comparison of impacts to paleontological resources from the No Project-No DMP Update Approval Alternative to the DMP Update cannot be determined.

7.3 PROJECT LEVEL ALTERNATIVES ANALYSIS

The following provides a comparative alternatives analysis for the proposed Agua Hedionda and Calavera Creeks Dredging and Improvements Project (i.e., components B and BN). Potential impacts of the alternatives are evaluated and compared by each issue area to identified impacts of the proposed project, as evaluated in Chapter 4.0 of this EIR.

7.3.1 No Project Alternative

The No Project Alternative assumes no channel dredging and no improvements to Agua Hedionda or Calavera creeks. Buildout conditions would remain the same for the other related projects: the four detention basins which have been completed (BJB Basin, BJ Basin, Faraday Basin, and Melrose Basin); proposed improvements to Calavera Dam; completed modifications to the BJB outlet structures; and new 500-cfs conveyance facility on the north side of the wall bisecting Calavera Creek. Under the No Project alternative, 68 of the 278 lots currently within the 100-year floodplain would receive flood protection from the four detention basin projects. Up to 210 lots would remain in the floodplain.

7.3.1.1 Land Use

The proposed project would not result in significant land use impacts. The No Project Alternative would result in land use impacts by providing inadequate drainage to accommodate 100-year flood conditions. The No Project Alternative would subject up to 210 lots to flooding, which would conflict with the goals and policies of the General Plan Public Safety Element to minimize damage to property resulting from the occurrence of floods. For this reason, the No Project Alternative would result in greater land use impacts than the proposed project.

7. 3.1.2 Agricultural Resources

The proposed project would not result in the conversion of Important Farmland or convert agriculture land use to nonagricultural uses. Similarly, the No Project Alternative would not involve any changes to existing agricultural land or Important Farmland. Potential impacts would be similar to the proposed project.

7.3.1.3 Visual Resources

The proposed project would not have potentially significant impacts to visual resources and would provide an overall visual benefit to the creeks. Although some vegetation removal would be required, many of the mature native tress would remain along the creek banks. The No Project Alternative would not address the erosion issues along the creeks and would not involve any improvements or maintenance to the creeks. Although no vegetation removal would be required, flooding issues would continue to degrade the creeks due to erosion and sedimentation, resulting in a reduction of the visual qualities of the creeks. Views of the creeks for Rancho Carlsbad residents would be degraded; thus, impacts would be greater overall than for the proposed project.

7.3.1.4 Transportation/Circulation

The proposed project would not result in significant long-term impacts to transportation/ circulation. Short-term construction-related impacts would be minimized through implementation of the project design features/methods and construction measures identified in Table 3-6 and would not be significant. The No Project Alternative would not involve construction or operation and maintenance activities and, therefore, would not result in short-term traffic impacts. However, because the creek capacity would not be improved, flooding during an extreme storm event could compromise use of the Cannon Road or El Camino Real bridges, resulting in impacts to traffic and emergency access on these roadways, as well as emergency access to some homes in Rancho Carlsbad, which would be difficult to access because of flooding. For this reason, the No Project Alternative would result in greater traffic impacts.

7.3.1.5 Air Quality

The proposed project would not result in significant air quality impacts but would involve the incorporation of construction measures (see Table 3-6) to minimize construction-related impacts such as contamination from fugitive dust and exhaust. The No Project Alternative would not involve any construction or operations and maintenance activities and, therefore, would not involve any air quality emissions. Impacts would be fewer than for the proposed project.

7.3.1.6 Noise

The proposed project would result in potentially significant noise and vibration impacts related to construction and operation and maintenance activities. The No Project Alternative would not involve any construction or operations and maintenance activities and, therefore, would not involve any noise impacts. Impacts to noise would be fewer than for the proposed project.

7.3.1.7 Recreation

The proposed project would not result in significant impacts to recreational services in the city. Similarly, the No Project Alternative would not involve construction of recreation facilities nor would it affect the use of existing facilities. Impacts would be similar to the proposed project.

7.3.1.8 Geology/Soils

The proposed project would not result in significant impacts to geology/soils. The No Project Alternative would not involve slope stabilization of the creeks or erosion control measures. The creek slopes would continue to experience erosion and stabilization problems. For this reason, the No Project Alternative would have greater impacts to geology/soils than the proposed project.

7.3.1.9 Hydrology/Water Quality

The proposed project would not result in significant impacts to water quality and would provide an overall improvement to storm water quality within the creeks and downstream. The No Project Alternative would not involve any improvements to storm water quality. Sedimentation and erosion would continue to degrade water quality in the creeks. Up to 210 lots would be exposed to the risk of flooding during a 100-year storm event. For these reasons, the No Project Alternative would result in greater impacts to hydrology/water quality.

7.3.1.10 Biological Resources

The proposed project would result in significant, but mitigable impacts to biological resources resulting from the potential loss of sensitive vegetation and habitat and impacts to jurisdictional waters. The No Project Alternative would not involve any dredging or grading of the creek slopes and therefore would not result in temporary or long-term impacts to sensitive habitats,

vegetation, or jurisdictional waters. Therefore, the No Project Alternative would result in fewer impacts to biological resources than the proposed project.

7.3.1.11 Cultural Resources

The proposed project would not have significant impacts to cultural resources. Similarly, the No Project Alternative would not involve any construction or operations and maintenance activities and, therefore, would not have the potential to impact cultural resources. Impacts would be similar to the proposed project.

7.3.1.12 Paleontological Resources

The proposed project would not have significant impacts to paleontological resources. Similarly, the No Project Alternative would not involve any construction or operations and maintenance activities and, therefore, would not have the potential to impact paleontological resources. Impacts would be similar to the proposed project.

7.3.2 2:1 Side Slope Design Alternative

The design concept for the 2:1 Side Slope Design Alternative is similar to the proposed Agua Hedionda and Calavera Creeks Dredging and Improvements Project described in Chapter 3.0 (Project Description) of this EIR, but the design includes 2:1 (H:V) side slopes along the majority of the creeks slopes (instead of 1.5:1 [H:V]) slopes and a proposed channel bottom width of 70 feet between the Cannon Road and El Camino Real bridges. Based on this design, approximately 40,000 cy of material would be dredged from Agua Hedionda Creek and 2,500 cy of material would be dredged from Calavera Creek, for a total of approximately 42,500 cy. Under this alternative, up to 252 of the 278 lots currently within the 100-year floodplain would receive flood protection during a 100-year storm event, while the remaining 26 lots would remain in the floodplain. Figures 7-1a through 7-1f show the preliminary design drawings for the 2:1 Side Slope Design Alternative. The figures also illustrate the location of native and nonnative trees along the creek banks, and which trees would be removed to accommodate the 2:1 slope design (identified by a circle with a cross through it). A 107-work day construction schedule was assumed for this alternative (48 days for excavation of Agua Hedionda Creek, 15 days for excavation of Calavera Creek, and 44 days for channel improvements and bridge repairs).

7.3.2.1 Land Use

The proposed project would not result in significant land use impacts. The 2:1 Side Slope Design Alternative would result in land use impacts by providing inadequate drainage to accommodate 100-year flood conditions. The alternative design would subject up to 26 lots to flooding during a 100-year storm event, which would conflict with the goals and policies of the General Plan Public Safety Element to minimize damage to property (including homeowner improvements) resulting from the occurrence of floods. For this reason, the alternative would result in greater land use impacts than the proposed project.

7.3.2.2 Agricultural Resources

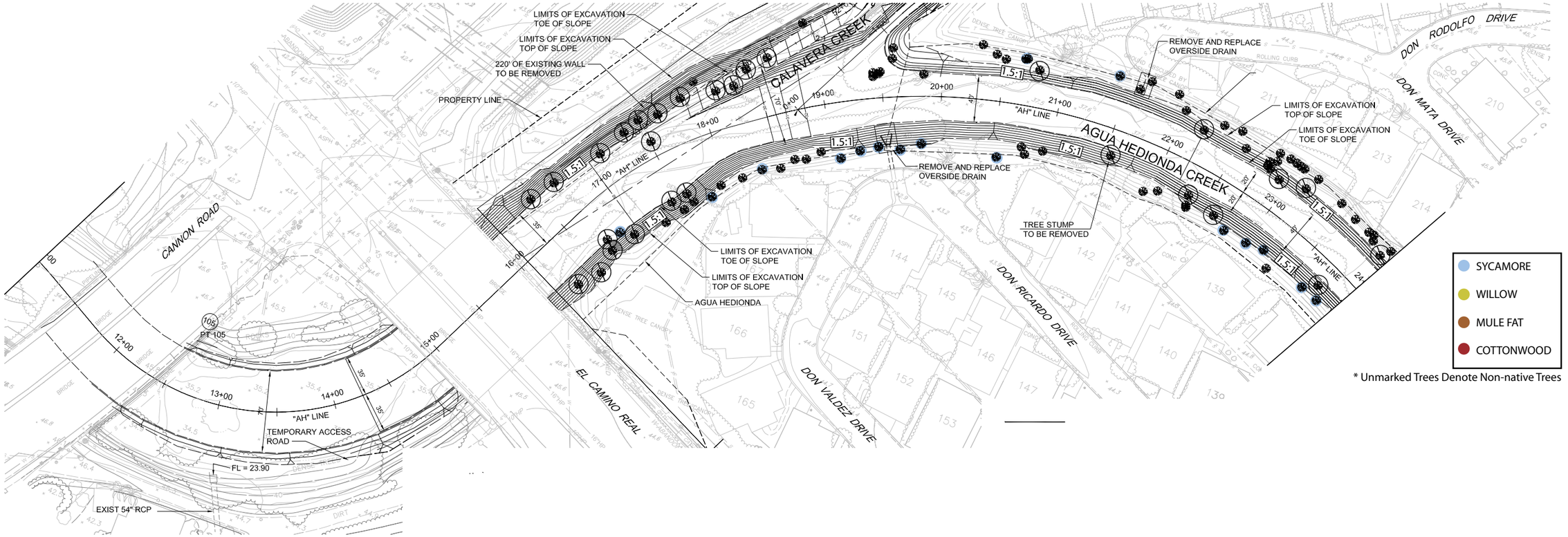
The proposed project would not result in the conversion of Important Farmland or convert agriculture land use to nonagricultural uses. Similarly, the 2:1 Side Slope Design Alternative would not involve any changes to existing agricultural land or Important Farmland. Potential impacts would be similar to the proposed project.

7.3.2.3 Visual Resources

The proposed project would not have potentially significant impacts to visual resources and would provide an overall visual benefit to the creeks. Although some vegetation removal would be required, many of the mature native tress would remain along the creek banks. The 2:1 Side Slope Design Alternative would involve more grading of the creek slopes (due to the reduced slope design), resulting in the removal of more trees (mostly nonnative) along the channels. Thus, existing views of the creeks would be degraded more than with the proposed project. Overall, there would be greater visual impacts to the creeks resulting from this alternative.

7.3.2.4 Transportation/Circulation

The proposed project would not result in significant short-term or long-term impacts to transportation/circulation. The 2:1 Side Slope Design Alternative would involve similar construction, operation, and maintenance activities. Up to 33 round-trip truck trips would be required per day over the 63-day excavation schedule for the two creeks, compared to 30 round-trip truck trips over 55 days for the proposed project. Therefore, this alternative would result in greater short-term traffic impacts. However, short-term construction-related impacts would be minimized through implementation of the project design features/methods and construction measures identified in Table 3-6 and would not be significant. The alternative would have no long-term traffic impacts.



Source: Brown & Caldwell 2006

90 45 90 Feet

Figure 7-1a
2:1 Side Slope Option

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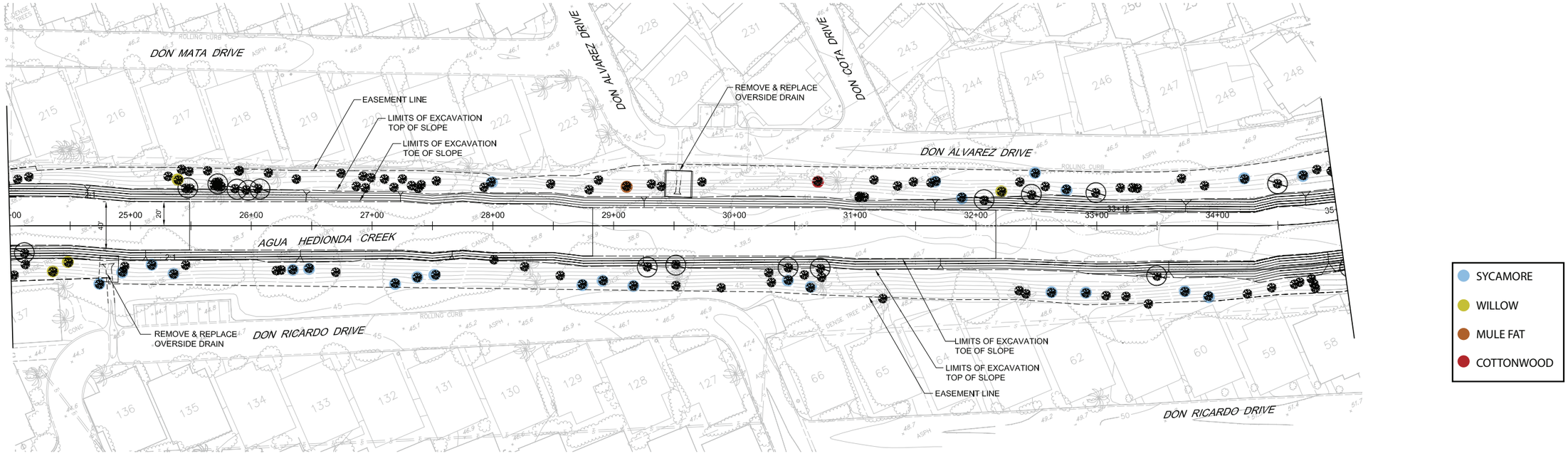

Source: Brown & Caldwell 2006

90 45 90 Feet

Figure 7-1b
2:1 Side Slope Design Alternative

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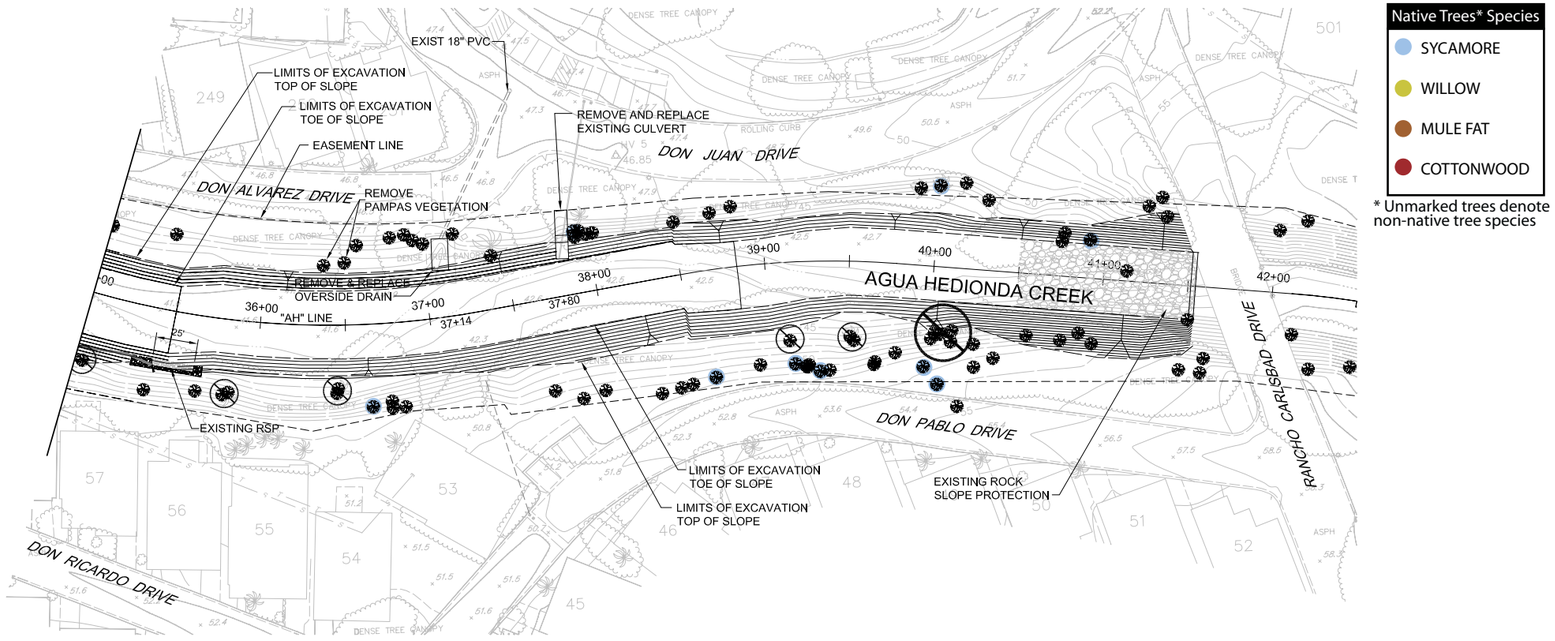

Native Trees* Species

- SYCAMORE
- WILLOW
- MULE FAT
- COTTONWOOD

* Unmarked trees denote non-native tree species

Source: Brown & Caldwell 2006

90 45 90 Feet

Figure 7-1c
2:1 Side Slope Option

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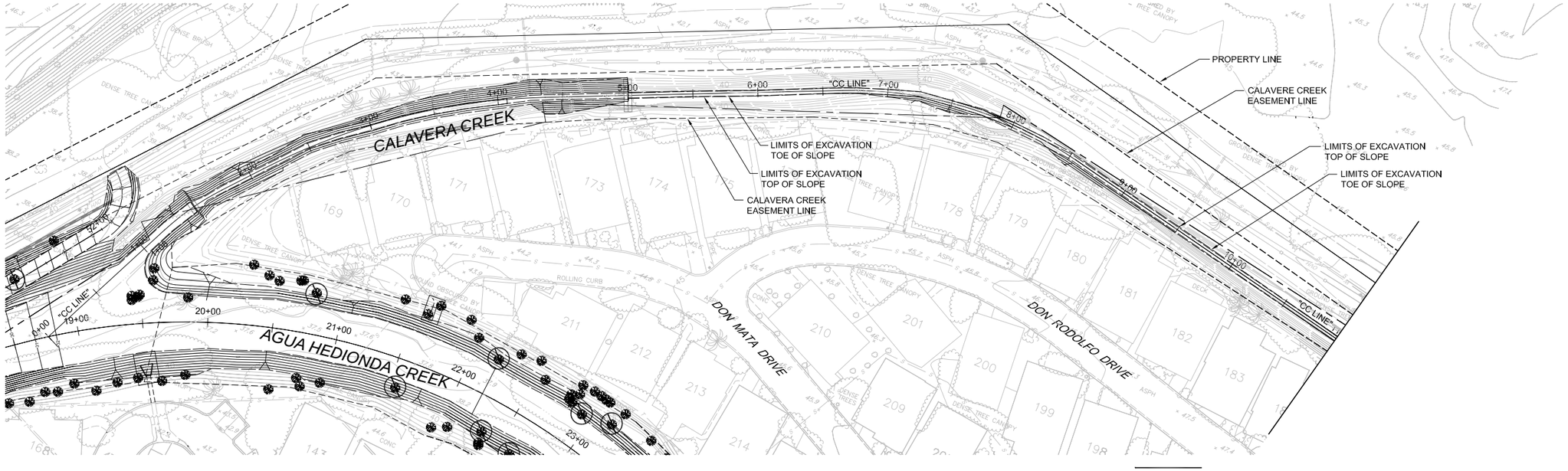

Source: Brown & Caldwell 2006

90 45 90 Feet

Figure 7-1d
2:1 Side Slope Option

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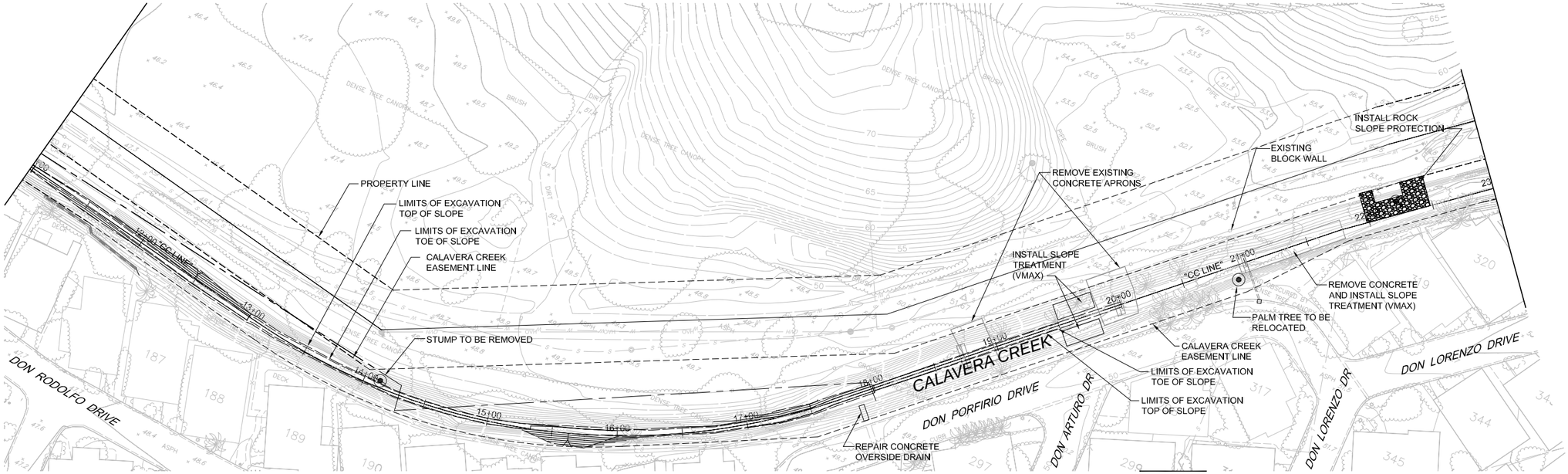

Source: Brown & Caldwell 2006

90 45 90 Feet

Figure 7-1e
2:1 Side Slope Option

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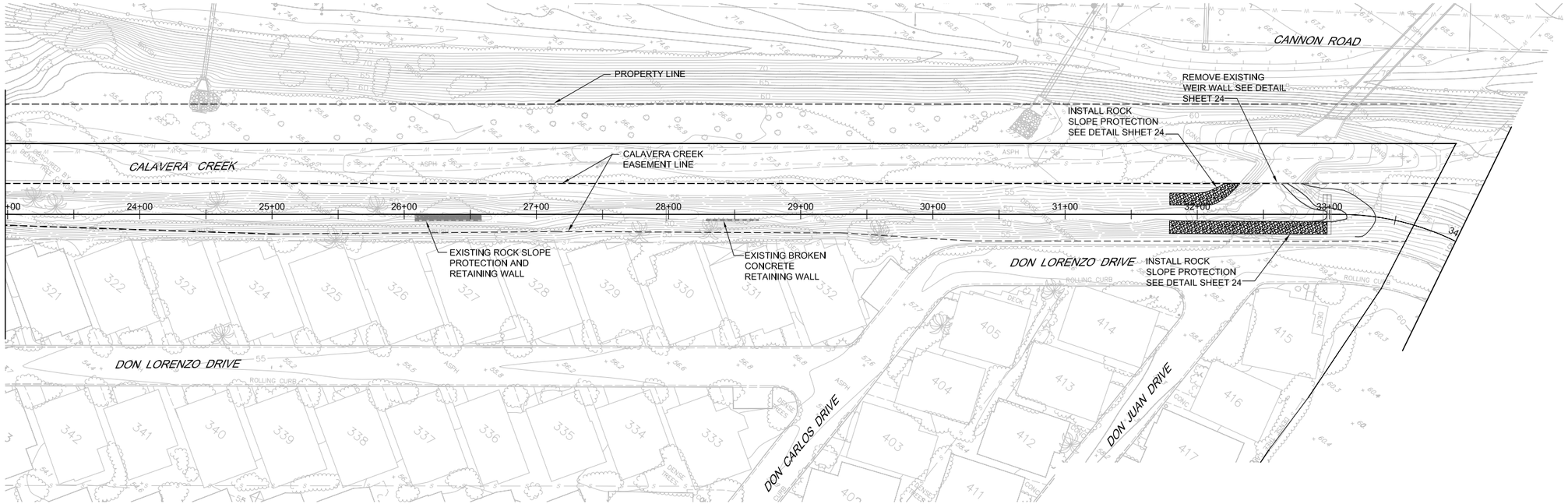

Source: Brown & Caldwell 2006

90 45 90 Feet

Figure 7-1f
2:1 Side Slope Option

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7.3.2.5 Air Quality

The proposed project would not result in significant air quality impacts. The 2:1 Side Slope Design Alternative would involve similar construction, operation, and maintenance activities but would require more grading and truck trips to dispose of excavated material. Therefore, this alternative would have greater short-term construction-related air quality impacts. However, incorporation of construction measures (see Table 3-6) would minimize construction-related impacts such as contamination from fugitive dust and exhaust. The alternative would have no long-term impacts.

7.3.2.6 Noise

The proposed project would result in potentially significant noise and vibration impacts related to construction, operation, and maintenance activities. The 2:1 Side Slope Design Alternative would involve similar construction, operation, and maintenance activities and, therefore, would involve similar noise impacts.

7.3.2.7 Recreation

The proposed project would not result in significant impacts to recreational services in the city. Similarly, the 2:1 Side Slope Design Alternative would not involve construction of recreation facilities and nor would it affect the use of existing facilities. Impacts would be similar to the proposed project.

7.3.2.8 Geology/Soils

The proposed project would not result in significant impacts to geology/soils. The 2:1 Side Slope Design Alternative would involve similar types of slope stabilization or erosion control measures for the creeks. However, because a 2:1 (H:V) slope is less steep than 1.5:1 (H:V) slope, the slopes would have more long-term stability (Ninyo & Moore 2006). Overall, the 2:1 slopes would be subject to less erosion and require less maintenance. For this reason, the 2:1 Side Slope Design Alternative would have fewer impacts to geology/soils than the proposed project.

7.3.2.9 Hydrology/Water Quality

The proposed project would not result in significant impacts to water quality and would provide an overall improvement to storm water quality within the creeks and downstream. The 2:1 Side

Slope Design Alternative would involve similar improvements to the creeks and result in similar improvements to water quality, although the less steep design would be subject to less erosion. However, up to 26 lots would be exposed to the risk of flooding during a 100-year storm event. For this reason, the alternative would result in greater impacts to hydrology/water quality.

7.3.2.10 Biological Resources

The proposed project would result in significant, but mitigable impacts to biological resources resulting from the potential loss of habitat and sensitive biological resources. The 2:1 Side Slope Design Alternative would involve the removal of more mature trees, but these trees would primarily be nonnative. However, these trees could potentially provide habitat for nesting raptors. Removal of these trees would reduce potential nesting habitat. The alternative would still result in a loss of sensitive riparian habitat and would affect jurisdictional waters. Therefore, the alternative would result in greater impacts to biological resources.

7.3.2.11 Cultural Resources

The proposed project would not have significant impacts to cultural resources. Similarly, the 2:1 Side Slope Design Alternative would not likely encounter cultural resources during ground-disturbing activities associated with dredging because of the level of previous disturbance in the area. Impacts would be similar to the proposed project.

7.3.2.12 Paleontological Resources

The proposed project would not have significant impacts to paleontological resources. Similarly, the 2:1 Side Slope Design Alternative would not likely encounter paleontological resources during ground-disturbing activities associated with dredging because of the level of previous disturbance in the area. Additionally, the proposed project boundary is located on Quaternary alluvial deposits, which have a low to moderate potential to contain paleontological resources. For these reasons, the alternative would result in similar impacts to the proposed project.

7.4 FEASIBILITY OF ALTERNATIVES

The objectives of the DMP Update are understood to be those described in Chapter 3.0 (Project Description) of this EIR. The objectives of proposed project components are to modify and improve existing storm drain infrastructure and drainage areas, as well as construct additional infrastructure required to accommodate storm flows resulting from future development within

Carlsbad. This section evaluates the feasibility of each of the alternatives, including the No Project Alternative, with respect to achieving the identified DMP Update objectives.

7.4.1 Program Level

7.4.1.1 No Mechanized Dredging or Vegetation Removal Alternative

While this alternative could be implemented and is considered feasible, as discussed in Section 7.2.1.1, it would not provide adequate drainage channel capacity in the city and could result in flooding hazards. Therefore, it would not achieve the objective of the DMP Update to provide adequate flood protection to the city.

7.4.1.2 No Project Components within Sensitive Habitats or Wetlands within the Coastal Zone or HMP Preserve

The proposed DMP Update components were identified with consideration of environmental constraints. Additionally, environmental considerations were taken into account in the selection of materials and types of construction/restoration/modification required. For example, water quality issues were assessed to determine appropriate locations of water quality basins. However, components that would occur within sensitive habitats were determined to be critical to providing sufficient drainage channel capacity. Therefore, elimination or relocation of these components could potentially result in flooding hazards in these areas. While this alternative could be implemented and is considered feasible, this alternative would not achieve the objective to provide 100-year flood capacity throughout the city to the extent of the DMP Update, as proposed.

7.4.1.3 Reduced Use of Impervious Materials Alternative

This alternative would meet the objectives of the DMP Update. The DMP Update considered environmental constraints in the determination of appropriate materials to use for the construction/modification of drainage facilities. The DMP Update incorporates the use of pervious materials, but there may be an opportunity to further substitute concrete with alternative materials. However, use of concrete structures may be required to achieve the necessary hydrologic function of certain facilities. This alternative is considered feasible overall, but the additional use of pervious materials would be reevaluated during project-specific design. This alternative may involve removal of existing concrete structures, which would require additional restoration and recontouring of existing facilities.

7.4.1.4 No Project-No Build Alternative

This alternative would not implement the proposed components in the DMP Update and, therefore, would not meet any of the objectives of the DMP Update. This alternative is also infeasible because drainage improvements are necessary to address changes in development and land use in the city, which would not be provided unless the proposed DMP Update components were implemented.

7.4.1.5 No Project-No DMP Update Approval Alternative

The purpose of the DMP Update is to provide adequate drainage infrastructure to accommodate storm flows in the city through improvements to existing facilities and construction of new facilities. If the DMP Update is not implemented, the deficiencies and potential problems with existing drainage infrastructure would remain and would continue to require remedy. Likewise, the new facilities proposed in the DMP Update are required to accommodate storm flows generated by planned future growth in Carlsbad. Under the No Project-No DMP Update Approval alternative, the same or similar drainage improvements would likely be approved as individual projects, but in piecemeal fashion and not as an integrated program that had been evaluated as a single environmental project. The No Project-No DMP Update Approval Alternative would involve piecemeal implementation and potential relocation of drainage facilities based on localized needs. Drainage improvements would be more localized and would not necessarily provide 100-year flood protection for the entire city. Citywide drainage needs would not be assessed at the basinwide level, which would not achieve the objectives of the DMP Update.

7.4.2 Project Level

No Project Alternative

Although the No Project Alternative would be feasible, the alternative would not achieve the objectives of the proposed Agua Hedionda and Calavera Creeks Dredging and Improvements Project because the alternative would not reduce flooding risk to Rancho Carlsbad to the extent feasible by removing as many lots as possible from the 100-year floodplain. Up to 210 lots would remain in the 100-year floodplain.

2:1 Side Slope Design Alternative

This alternative would be considered feasible. However, this alternative would result in up to 26 lots remaining in the 100-year floodplain. Therefore, the alternative would not achieve the objectives of the proposed project.

7.5 SUMMARY OF ALTERNATIVES EVALUATION AND ENVIRONMENTALLY SUPERIOR ALTERNATIVE

This section summarizes the program and project level alternatives analysis and identifies the environmentally superior alternative at the program and project level. CEQA requires that an EIR identify the environmentally superior alternative from among the proposed project and range of evaluated alternatives (other than the No Project Alternative). The environmentally superior alternative is considered the alternative that causes the fewest or least significant environmental impacts while achieving the objectives of the project.

7.5.1 Program Level

Table 7-1 summarizes the findings from the program level alternatives evaluation. This analysis is qualitative rather than quantitative. If any of these alternatives were pursued, additional environmental review would be required to quantify the anticipated impacts and to recommend appropriate mitigation measures consistent with the level of impact.

Based on the qualitative evaluation of the alternatives in this section, implementation of the Reduced Impact to Sensitive Habitats and Wetlands Alternative would be the environmentally superior alternative. Overall, this alternative would result in fewer impacts than the DMP Update, as proposed, while achieving the DMP Update objectives. While this alternative would result in fewer impacts than the DMP Update to Visual Resources, Noise, and Biological Resources (Table 7-1), impacts would generally still be considered significant for these issue areas. However, the DMP Update was developed with consideration of environmental constraints and generally avoids locating facilities within sensitive habitats or wetlands. A facility is only proposed in sensitive habitats and wetlands if the facility is necessary to achieve flood control and adequate storm flow conveyance to meet the objectives of the DMP Update, which would not be achieved with an alternative location. As with the DMP Update, incorporation of the mitigation measures included in this EIR would reduce impacts to a less than significant level. Neither implementation of the Reduced Impact to Sensitive Habitats and Wetlands Alternative nor the DMP Update (as demonstrated in the analysis included in Chapters

Table 7-1
Program Level Alternatives Comparison of Impacts to DMP Update Impacts[1]

Issue Area	Project Alternatives				
	No Mechanized Dredging or Vegetation Removal	**Reduced Impact to Sensitive Habitats and Wetlands**	**Reduced Use of Impervious Materials**	**No Project- No Update to the Existing 1994 MDSQMP**	**No Project- No DMP Update Approval**
Land Use	Greater	Similar	Similar	Greater	Greater
Agriculture	Similar	Similar	Similar	Similar	Undetermined
Visual Resources	Similar	Similar	Similar	Greater	Undetermined
Transportation/Circulation	Similar	Similar	Similar	Greater	Undetermined
Air Quality	Similar	Similar	Similar	Similar	Undetermined
Noise	Fewer	Fewer	Similar	Fewer	Undetermined
Recreation	Similar	Similar	Similar	Similar	Undetermined
Geology/Soils	Similar	Similar	Similar	Similar	Undetermined
Hydrology/Water Quality	Similar	Similar	Similar	Greater	Greater
Biological Resources	Fewer	Fewer	Fewer	Fewer	Undetermined
Cultural Resources	Similar	Similar	Similar	Fewer	Undetermined
Paleontological Resources	Similar	Similar	Similar	Fewer	Undetermined
Achieves DMP Update Objectives	No	Yes	Yes	No	No

[1] Greater = Alternative results in greater impacts than the DMP Update, even if the DMP Update would result in significant impacts to the issue area.
Fewer = Alternative results in fewer impacts than the DMP Update but would not necessarily reduce impacts to a less than significant level.
Similar = Alternative results in similar impacts as the proposed DMP Update.

4.0 and 5.0) would result in any unmitigable significant impacts directly, indirectly, or cumulatively. While the Reduced Impact to Sensitive Habitats and Wetlands Alternative is considered the environmentally superior alternative, it may not achieve the level of flood control that would be provided by implementation of the DMP Update, as demonstrated in this analysis.

7.5.2 Project Level

Table 7-2 summarizes the findings from the project level alternatives evaluation.

Based on the analysis, the No Project Alternative would potentially result in fewer impacts to the issue areas of Noise, Air Quality and Biological Resources. However, the alternative would potentially result in greater impacts to Land Use, Visual Resources, Transportation/Circulation, Geology/Soils, and Hydrology/Water Quality. Further, the No Project Alternative would not achieve the objectives of the proposed project because up to 210 lots would not receive flood protection during a 100-year storm event.

Table 7-2
Project Level Alternatives Comparison of Impacts [1]

Issue Area	Project Alternatives	
	No Project	**2:1 Slope Design**
Land Use	Greater	Greater
Agriculture	Similar	Similar
Visual Resources	Greater	Greater
Transportation/Circulation	Greater	Greater
Air Quality	Fewer	Greater
Noise	Fewer	Similar
Recreation	Similar	Similar
Geology/Soils	Greater	Fewer
Hydrology/Water Quality	Greater	Greater
Biological Resources	Fewer	Greater
Cultural Resources	Similar	Similar
Paleontological Resources	Similar	Similar
Achieves Project Objectives	No	No

[1] Greater = Alternative results in greater impacts than the proposed project, even if the proposed project would result in significant impacts to the issue area.

Fewer = Alternative results in fewer impacts than the proposed project but would not necessarily reduce impacts to a less than significant level.

Similar = Alternative results in similar impacts as the proposed project.

The 2:1 Side Slope Design Alternative would potentially result in fewer impacts to the issue area of Geology/Soils. However, this alternative would potentially result in greater impacts to Visual Resources, Hydrology/Water Quality, and Biological Resources and would not achieve the objectives of the proposed project as up to 26 lots would not receive flood protection during a 100-year storm event.

Because neither of the alternatives would achieve the objectives of the proposed project and would potentially result in greater impacts to some of the issue areas, the proposed Agua Hedionda and Calavera Creeks Dredging and Improvements Project would be the environmentally superior alternative.

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